

## Lesson Plan

Assessment	Proposal, Rubric
Cross-curricular	

### Big Ideas

- Ecosystems are in a constant state of change. The changes may be caused by nature or by human intervention.
- Human activities have the potential to alter the environment. Humans must be aware of these impacts and try to control them.

### Learning Goals

- To see that having protection programs in place can drastically increase the chances of a life form surviving in an ecosystem where humans are also active.
- To learn about some of the many ways that humans can reduce and manage their impact on ecosystems.

### Specific Expectations:

- 1.2** analyse the costs and benefits of selected strategies for protecting the environment.
- 2.3** use scientific inquiry/research skills to investigate occurrences that affect the balance within the ecosystem (invasive species)
- 2.4** use appropriate science and technology vocabulary.
- 3.1** demonstrate an understanding of an ecosystem as a system of interactions between living organisms and their environment.
- 3.8** describe ways in which human activities and technologies alter balances and interactions in the environment

### Description:

This is the **fifth** lesson in a five-lesson unit on ecosystems. This last day will focus on protection programs that help reduce human impact on ecosystems. To wrap up the unit and evaluate what the students have absorbed from the game, students will come up with a proposal for protection of an ecosystem.

### Materials/Resources:

Game rules summary (see link)  
 Game Pieces, includes board and cards (see link)  
 Scissors (one for each student)  
 Dice (one per student group)  
 Playing pieces (e.g. Lego figures, or any other token you can come up with)

Ecosystem Protection Proposal (see link)  
 Wrap Up Evaluation Rubric (see link)

### Safety Notes

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## Introduction

On this last day students will focus on protection programs that help reduce human impact on ecosystems. The game works in two rounds. In the first round, students will play humans who modify the environment. In the second round they then see if life forms can survive in this modified ecosystem. The rules of the game are the same as day 4, which provides an easy way for students to contrast the difference between having no protection and having programs to protect the environment in place.

## Brief Review

- Yesterday students played humans modifying their environment and then students played life forms trying to survive.
- **Discussion question:**
  - What did we find?
    - Cumulative human impact can lead to a life form dying.
    - Humans can have many negative impacts on the environment of an ecosystem.
    - Some life forms can adapt to changes and sometimes that may even lead to them thriving.

## Pre-Game Discussion

- Can you think of any examples of how humans protect life forms?
  - Parks, diverting garbage to recycling and into properly constructed landfills, animal bridges etc.... Just take a few examples.
  - Do you think these examples make it easier for animals and plants to survive or even thrive?
  - Can it go too far? (No room for humans to develop etc.)
  - Let's play the game and discuss more at the end.

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## Action

### Game Rules and Setup

If necessary review the rules from Day 4 (See Game Summary link). As yesterday students played two rounds per game. In the first round students all act as humans who impact the ecosystems they are active in. In the second round the students play life forms trying to survive in the altered ecosystem. The difference is that today humans also get the choice to start protection programs (by playing such a card).

- Students cut out new cards for today. (See Game Pieces link)
- Students set up the board as per day 4.
- Instead of the “no impact” cards place **10 new cards into the deck** (choose from the 12 available or create students can create their own!).
- Play round 1, same as last day.
  - Each player can freely choose when to play the “protection” cards.
- Play round 2, same as last day.

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## Consolidation/Extension

### Discussion questions:

- Did the game end differently than yesterday? Was your life form able to survive? What did you learn?
  - A protection effort can negate the effect of a human activity.
  - Today we played just by adding and subtracting points; in real life you need to tailor the protection to the needs of the ecosystem and the type of human activity taking place.
    - For example: create a park beside an area that is being developed for mining.
    - Limit access for climbers to a cliff during the eagles breeding season (so their young hatchlings can have peace and quiet for their first few weeks of life).
    - Etc.
- What other examples of programs that are specifically designed to mitigate (balance out) human activity can you think of?

### Unit Wrap-Up

To wrap up the unit, consolidate learning, and evaluate what the students have absorbed from the game we get students to come up with a proposal for protection of an imagined (or real) ecosystem (See Ecosystem Protection Proposal and Wrap Up Evaluation Rubric links). This can be started in class and possibly finished at home or next day in class.

The proposal can be for an imagined ecosystem, but it should be of a type that actually exists. For example a student could describe a coral reef that is threatened by a new shipping lane. They can do research on a real coral reef to learn about the elements of such an ecosystem (biotic and abiotic), what the food web may look like, what can threaten this ecosystem and even how it may be protected. The idea is for the students to be **creative with what they come up with while including correct scientific facts about ecosystems.**

If you wish you can allow students to print pictures that reflect their ecosystem instead or in addition to the drawings.